

Spot and Stain Removal

MILDRED CARNEY



CORNELL BULLETIN FOR HOMEMAKERS

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FOREWORD

Skill in the removal of spots and stains is a necessary part of the homemaker's knowledge. Spots and stains on clothing and table linen occur frequently in the average household. If a homemaker is patient, careful, and willing to follow directions, she can remove successfully even the stubborn spots and stains.

The purpose of this bulletin is to act as a guide to the homemaker and other members of her family in this important part of household management. If one is unfamiliar with this phase of caring for clothing and table linen, it is suggested that the bulletin be read carefully before attempting to remove any stain. This insures a complete understanding of the nature of spots and stains, the substances used in removing them, and the methods that bring satisfactory results.

Stain removal has no short cuts. It requires patience, extreme neatness, and a good deal of painstaking effort.

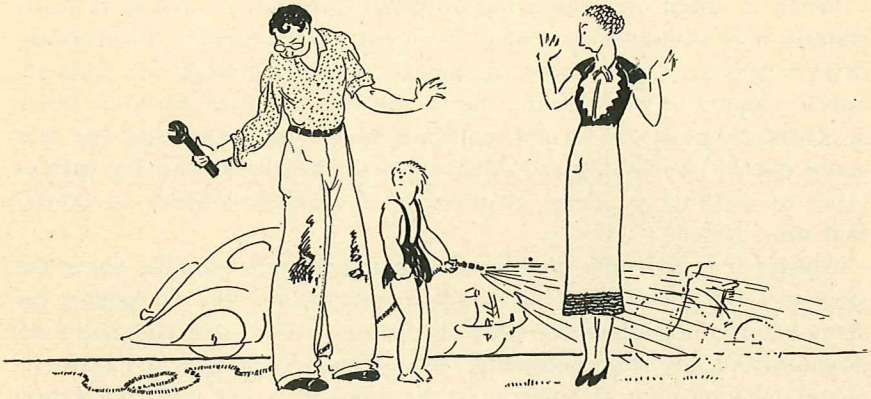
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SPOT AND STAIN REMOVAL

MILDRED CARNEY

THE KNOWLEDGE of how to remove spots and stains is an invaluable aid in maintaining the beauty of household textiles and in keeping one's clothing fresh and immaculate. Every homemaker is interested in this household skill, not only because it adds to the well-groomed appearance of each member of the family, but also because it is an economy to take care of what is on hand. Clothing and textiles that are well cared for last much longer than do those that are neglected.

GENERAL CARE OF FABRICS

Clothing

Before storing

When clothing is to be stored for a season, every garment should be carefully examined for spots and should be thoroughly cleaned. Stains made by fruit juices, soft drinks, tea, coffee, and the like can be readily removed when fresh, but after a time they may become "set." There is also added danger from moths on stained clothing, for moths thrive on soiled spots. There should always be adequate protection from moths for all clothing that is to be put aside for some months.¹

¹Refer to Cornell Extension Bulletin 202, *Common Insects of the Household*, by Glenn W. Herrick and Grace H. Griswold.

Sending garments to dry-cleaner

When in doubt or when a highly prized garment or article is badly stained, it is advisable to send it to an expert dry-cleaner. Professional dry-cleaners have the proper equipment, proper materials for stain removal, experts to work on the stains, and the benefit of research which is constantly going on as new materials appear on the market and new stains appear on clothing and other articles. They know also the various types of cleaning processes required by the different kinds of fabrics that may be sent to them.

Always it is advisable to give all the information possible about the stain to the dry-cleaner. This makes it possible for him to remove the spots before the general dry-cleaning process is used, and eliminates the possibility of any stain becoming "set." However, in spot and stain removal, whether done at home or by a professional, one must not expect miracles, as often a stain has so affected a fabric that it is impossible to remove the stain without damaging the fibers.

Removal of spots and stains at home

The removal of spots and stains from fabrics may be successfully accomplished at home if promptness, patience, and perseverance are used. These requisites are just as essential as are the reagent and methods necessary for success, for the removal of spots and stains takes careful manipulation, especially if several different methods and many substances must be employed to remove the stain entirely and still keep the fabric uninjured. Rayon and silk garments, or those containing a combination of the two, present a difficult problem, and unless one is sure of the proper method and of a reagent that will take out the stain but leave the fabric unharmed, it is best to send such garments to a reliable dry-cleaner. However, if the stain is a simple one and the clothing not too valuable, it pays to save a cleaning bill by removing the spots at home.

Woolen garments are not so difficult a problem when stained, for most woollens are not harmed by soap and water, thus making it possible to use water and other solvents without disastrous results. A detergent is often most effective (page 15).

Before laundering

Cotton and linen clothing should not be put into the laundry until after they have been examined for stains. Spots should be cared for promptly while still comparatively fresh, for with a newly made spot there is only the stain to deal with, while in an old one there is the added problem of dust and dirt and possibly a chemical reaction.

**Remove the stain
as soon as it
appears.**

Household linens

Unless household linen is cared for as soon as stains appear, it is likely to retain some of them forever, hence the wise homemaker takes out all visible stains before the article goes through the washing process. Cold water is not likely to harm fabrics and may do wonders for them, therefore the old-fashioned method of soaking linen in cold water is a good one. Hot water and soap may set stains and make them impossible to remove. The usual food stains on table linen come from protein, fat, sugar, tea, coffee, and fruit. The proteins in such substances as blood and egg often dissolve in cold water, whereas they are set by hot water; fats will not dissolve in water but they may be removed by warm suds; sugar dissolves much more readily in hot water than in cold water. Almost all fruit stains contain, besides sugar, a sticky gum-like substance which is soluble in boiling water (page 32). Tea and coffee stains when fresh are easily removed by pouring boiling water through them (page 46).

FUNDAMENTALS FOR SUCCESS IN SPOT AND STAIN REMOVAL

Before one attempts this household skill, it is advisable to consider the following points:

The kind of stain.

The kind of material, whether it is silk, wool, linen, cotton, rayon, or a combination of some of these. Each fabric presents a different problem.

The various reagents used in spot and stain removal.

The proper reagent to remove the stain without injuring the fabric.

That a reagent should be tried on an unexposed part of the material first to see the effect.

That a stain should be removed as soon as it appears, because changes in the character of the stain due to drying, exposure to the air, washing, soap, or ironing make drastic measures necessary and sometimes make removal of the stain impossible.

That correct manipulation of the material and the reagent is essential to success, and that amateur and even professional efforts sometimes fail.

METHODS OF APPLYING STAIN REMOVERS

Precautions

The first precaution to observe has already been mentioned: *Remove the stain as soon as it appears*, for prompt action may save the day.

The second precaution is to *try the effect of water or another reagent on an unexposed portion of the fabric*. Particularly if the stain is on colored

Always try a reagent on an unexposed part of the garment or article.

material, this a wise procedure, in order to see whether the stain remover takes the color from the fabric as well as to remove the stain. A reagent may be tried on an inside seam or on the inner part of the hem of a garment without the effect appearing on the outside. If water or the chemical used fades or changes the color, one will

Always test for fastness of color before applying reagent to the stain.

have to choose between the stain and a faded spot. The color effects in many delicately-colored materials are obtained by "top-dyeing," that is by putting one color on top of another until a rich effect is built up. If the top dye is not stable, it will then wash out easily, and leave a ring even on a clean fabric.

Chemicals and bleaches that are strong enough to remove stains usually affect dyes, therefore colored fabrics should be handled with care. One should work rapidly and rinse the materials thoroughly. If the color changes, the original color may sometimes be restored by the application of a weak solution of ammonia or by holding the material over an open ammonia bottle. Acetic acid also may be used.

A simple remedy for restoring color to a garment faded by the use of water or a reagent is to dampen a piece of material of the same color and texture and lay it over the spot where the color has been removed, then to press this material with a hot iron. The heat and moisture may draw the color from the piece and deposit it on the faded spot. This is not a permanent remedy but it makes a dress wearable if one has been unfortunate enough to have a whitish spot appear after stain removal. Such procedure is often successful with dark blue or black silk.

The third precautionary measure is to *apply a reagent for a short time only, wait for the effect, then make another application*. This takes more time and patience than to make one long application, but it pays in the long run because it is much more effective.

Many short applications of a reagent are more effective than one long one.

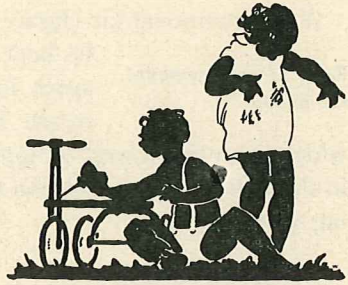
Unknown stains

The greatest prudence should be observed in dealing with unknown stains, and to remove them requires knowledge on the part of the worker. One needs to be familiar with the kind of material involved and with the action of different reagents upon it; hence, if the garment is valuable, it

With unknown stains proceed with care.

is sometimes better to send it to a reliable dry-cleaner and not to run the risk of spoiling it. However, the appearance, feel, and color of the stain

often give a clue as to its origin, and then by using care it may be possible to remove it. A dark semi-transparent stain is likely to be grease, and any dark-brown stain on table linen is probably grease that has been set by laundering. Tea, coffee, and cocoa stains are usually light brown or tan in color; if cream was in the tea or coffee, the transparency of grease will be evident. A stiff sugary stain is likely to be sirup, while one that is stiff but not sugary is probably varnish. Fruit stains are apt to be of various colors.



Before proceeding then with any attempt at removal, it is a wise precaution to *determine the nature of the stain if possible*. The most common spots and stains with which the housewife has to deal are general soil on collars and cuffs; grease spots from such substances as cod-liver oil, tar, automobile grease, gravy, and salad dressing; ink; fruit; sugar; and medicine. A special method of attack is necessary for each kind of stain on a specific material, and before beginning to remove a stain it is essential to have the proper equipment.



FIGURE 1. A STAIN-REMOVAL KIT

A stain-removal kit is a convenience and an economy for the well-groomed family

Stain-removal kit

A stain-removal kit (figure 1) should be in every household. It should be kept in a definite place where there is enough space for the contents and where it is convenient to use. Following is a list of materials and reagents which comprise a well-equipped kit. Many of these materials are usually in the home and the addition of the few extra reagents will aid in removing many stains.

Keep a stain-removal kit handy.

Absorbent cloths

Medicine droppers

Bowls

Soap flakes

Soap

Bubble cleaner

Fuller's earth—absorbent

Iron-rust soap—for removing iron rust and many other stains

Ammonium hydroxide—10-per-cent solution (may remove color)—for neutralizing acids

Detergent—for removing grease stains or dirt on dark woollens

Potassium permanganate—bleach

Oxalic-acid crystals (poison)—for removing iron rust (with hot water)

Oxalic-acid solution—bleach for removing brown stain left by potassium permanganate when used on cotton, linen, or silk

Javelle water—bleach (will remove color and will injure silk and wool)

Acetic acid—for neutralizing Javelle water

Peroxide—mild bleach—may be used on silk and wool, also to remove brown stain left by potassium permanganate on wool

Glycerine—for tannin stains

Carbon tetrachloride—grease solvent, non-inflammable

Amyl acetate—for removing cod-liver-oil stains

Turpentine—for removing paint

"Hypo" (sodium thiosulphate)—for removing iodine

Sodium hydrosulphite—bleaching agent and for removing dyes

Poisons

Among the substances referred to in this bulletin, some are poisons. These should be so clearly marked that no mistakes will be made. Effective ways of distinguishing poisons (figure 2) are: (1) To place the

bottle containing poison in a fruit jar with a tight lid; (2) to paste adhesive tape, one inch wide, over the cork and down the sides of the bottle; (3) to stick pins in the cork; or (4) to tie a small bell around the bottle to warn the proper-in-the-dark.

THE NATURE OF FABRICS, AND THEIR BEHAVIOR

A knowledge of fabrics has as much to do with successful spot removal as has a knowledge of the origin of the stain and the reagent to remove it, for the protection of the material is as vital as getting out the spots.

The many combinations of fibers, dyes, and finishes used in modern fabrics complicate stain removal, but, if the rules for removing stains are followed and precautions are taken, success may be acquired in this household skill.

The textile fibers from which materials are made are silk, wool, cotton, linen, and rayon. In the removal of stains from textiles, chemicals are often used; therefore, it is important to know something about the action of chemicals on different kinds of fibers.

Silk and wool

Silk fibers, made from the threads used by the silk worm in spinning its cocoon, and wool fibers, made from the coats of sheep and goats, are both animal products. As dry heat is injurious to animal fibers, fabrics of silk or wool should be pressed with an iron that is not too hot. Hard rubbing of wool entangles the fibers and causes shrinkage, but shrinkage is not likely to happen in stain removal because only a small area is involved. Wool and silk are both injured by alkalis such as lye (page 21). In removing stains from colored silk and woollen garments, precautions should be observed to retain the color (pages 7 and 8). When silk and wool are combined in a material, then it should be treated as if it were made of silk.

Cotton and linen

Cotton, spun from the soft protective fibers around the seeds of the cotton plant, and linen, spun from the fibers of the inner bark of flax plants, are both vegetable in origin, and therefore behave quite differently



FIGURE 2. CONTAINERS FOR POISONS
Poisons should be kept in a safe place

from silk and wool. Cotton and linen are both comparatively strong fibers that are able to stand high temperatures and rather rough treatment. Although they are less damaged by strong alkalis than are silk and wool, they are badly affected by concentrated acids such as oxalic acid (page 19). Precautions for preserving color should be observed if the linen or cotton is colored (pages 7 and 8).

Rayon

In the early days of its manufacture, rayon was an imitation of silk, but the industry has long since discarded this aim and now rayon is a distinct fiber and not a substitute. Chemically, rayon is allied to cotton, for it is a vegetable fiber produced from cellulose, the woody part of certain plants. Of the methods of preparing rayon, each gives a definite characteristic to the textile, but in the finished fabric the ordinary buyer cannot tell one from the other. However, it is not necessary to know what type of rayon one is buying except in the case of rayon that is made by the cellulose-acetate process. Rayon of this type is damaged by excessive heat; therefore, care should be exercised in pressing and in dry-cleaning and spot removal. Solutions containing ether, chloroform, or acetone should not be used, since they dissolve rayons made by the cellulose-acetate process.

All rayons, no matter by what process they are made, have one characteristic in common: they lose considerable strength when wet but regain it on drying. Therefore rayons need careful handling when being washed.

THE NATURE OF SUBSTANCES USED TO REMOVE STAINS

In general, stains are removed by absorption, by the action of a solvent, or by the chemical action of some reagents and by detergents. Many of the chemicals used may be classed as acids or alkalis. Both types include strong and weak reagents that can be used successfully only with a knowledge of their action on fabrics.

Absorbents

Blotting paper
Dry starch
Fuller's earth
Magnesia
Meals, such as cornmeal
Salt
Talcum powder
Unglazed paper

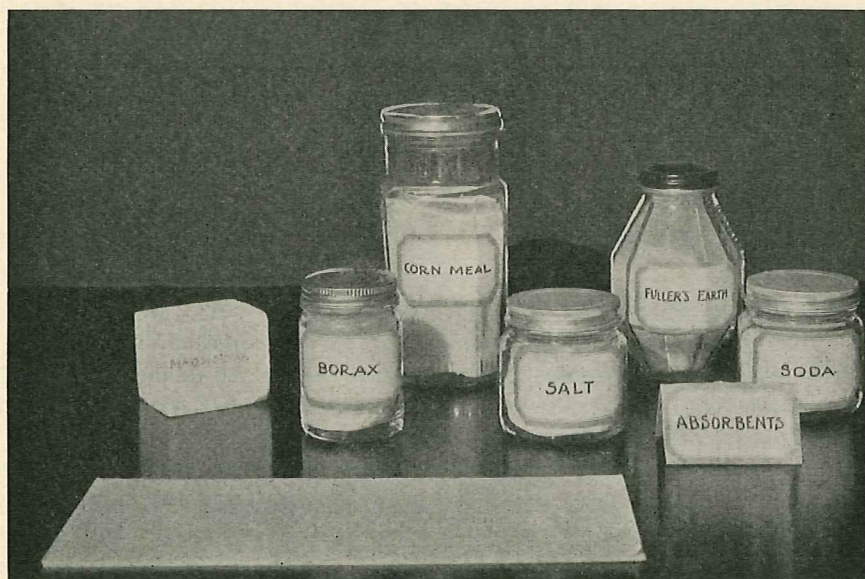


FIGURE 3. ABSORBENTS

Absorbents are effective in removing fresh grease stains

Absorbents (figure 3) are substances that act like blotting paper to take up a stain, hence they are more effective on fresh stains that are still moist than on old stains. An absorbent such as Fuller's earth is especially efficacious for fresh grease stains, new applications being made as fast as the grease is taken up by the earth.

In using absorbents, the stained fabric is spread on a flat surface and a layer of the absorbent is placed gently over the spot, without pulling the yarns of the material. As the stain is taken up, the remover is shaken off and a new layer put on, the procedure being repeated until the absorbent takes up no more grease. Then the spot is covered with a final layer of the absorbent to be left on for several hours.

Fuller's earth is an excellent absorbent to use on the back across the shoulders of silk dresses to absorb the oil that collects there, making an unsightly spot. To remove this, the absorbent is sprinkled on the soiled part, allowed to remain for one-half hour, then brushed off. A second application should be allowed to remain overnight. Since absorbents work more effectively on fresh stains, it is wise to apply the fuller's earth after each wearing of a dress, for then not only is the oiliness removed, but there is less likelihood of dust and dirt collecting on it.

For stains made by solid fats or tallows which must be melted before they can be absorbed, soft, unglazed paper may be used as the absorbent.

It should be placed over the spot and pressed with a warm iron. The heat of the iron melts the grease and the paper takes it up.

Solvents

Water	Ether
Alcohol	Gasoline, naphtha
Amyl acetate	Glycerine
Carbon tetrachloride	Kerosene
Chloroform	Turpentine

Solvents (figure 4) are substances that dissolve others. When stains are removed by water, the water has dissolved the staining substance so that it can be washed away. When using a solvent, since the dissolved stain must be given a place to go, an absorbent cloth is put under the stained part of the fabric (see *Pad Method*, page 21). A fresh blood stain can be removed by cold water, whereas hot water hardens it. Grease stains on washable fabrics are often rinsed in cold water first to prevent the grease from spreading, as would happen if heat were applied. Soap rubbed on a grease stain combines with the fat, thus changing it into a form that can be easily washed away with warm suds.

Water is the solvent most frequently used, often being effective in removing stains even from unwashable materials.

Alcohol is a clear, colorless liquid useful for removing grass stains and some medicine stains. It is a solvent for shellac, resin, vegetable oils, and fats. Alcohol is inflammable and volatile; that is, it catches fire easily and evaporates quickly. Alcohol affects dyes and the effect of denatured or rubbing alcohol on rayons made by the cellulose-acetate process depends more or less on the amount and type of the denaturant used.

Amyl acetate is a clear, colorless, inflammable liquid with a banana-like odor. It is used as a solvent for paint and lacquers.

Carbon tetrachloride is an excellent solvent for grease and may be applied without injury to most fabrics. Since it is non-inflammable, it is safe to use; but, being volatile, should be kept in a well-stoppered bottle to prevent evaporation. Carbon tetrachloride may be bought at any drug store and is much less expensive than many of the dry-cleaners on the market. In applying this solvent, the work should be done near an open window, because of its poisonous effect on human beings. A pad should be put under the stain to absorb it as rapidly as the carbon tetrachloride dissolves it, otherwise the stain spreads and makes the spot larger.

Chloroform is a colorless, volatile liquid with a sweetish odor. It dissolves grease, but it may affect the color of the material. Chloroform is expensive and not often used in the home. The fumes are dangerous to inhale. Its use is not advised.



FIGURE 4. SOLVENTS AND A DETERGENT

Solvents and a detergent are used in stain removal

Ether is a light, colorless, very volatile liquid with aromatic odor, used to dissolve fats and resins. Ether is highly inflammable and is not often used in the home. The fumes are dangerous to inhale. Its use is not advised.

Gasoline and **naphtha** also are highly volatile, inflammable liquids. They are dangerous to use though they are effective in removing grease, oil, and wax. If used, they should be handled with great care and away from all flame.

Glycerine is a clear, colorless, sirupy liquid used as a solvent for tannin. It is effective also as a skin softener to rub on the hands after working with dry-cleaning solvents which remove the natural oil of the skin.

Kerosene is a light, colorless oil, a good solvent for grass stains.

Turpentine is a light-colored, volatile liquid, distilled from the sap of fir and pine trees. It is a solvent for paints.

Detergents

A detergent is a soap solution containing a grease-dissolving agent. Since the action of a detergent is rapid and the garment may be cleaned

quickly, this method is valuable in taking care of spots on dark wool. It is especially good for men's and boys' clothing. The detergent should be tested on a hidden part of the garment to see whether it will remove the color; if it does so, diluting the solution may be all that is necessary to prevent fading. If a ring is left after using a detergent, it may be removed by steam (page 25).

The pad method (page 21) is used in working with a detergent, and the last step in the procedure is to use a clean cloth moistened with water to remove any trace of soap.

Recipe for detergent

- 1 ounce pure soap
- 1 pint hot soft water
- 1 pint cold water
- 1 ounce alcohol
- $\frac{1}{2}$ ounce ether
- 2 ounces ammonia

Shave the soap fine, add it to the hot soft water and allow this to stand until the soap is dissolved and the mixture is cool; then add the alcohol, ether, and ammonia which should have been mixed together at a drug store. Bottle the mixture and cork the bottle tightly.

Bubble cleaner. A foam or bubble type of cleaner is now on the market. The foam alone is used for cleaning. These cleaners are soap-like,



FIGURE 5. BLEACHES

Chemicals are sometimes used to bleach a stain

sudsy, and non-explosive. They are excellent for some types of stains. When using this type of cleaner, the suds, not the fluid, is used on the spot. These cleaners are used also for rugs, carpets, and upholstery.

Bleaches

Sunlight	Peroxide of hydrogen
Acetic acid	Potassium permanganate
Ammonia	Salts of lemon
Borax	Sodium hydrosulphite, for re-
Chloride of lime	moving some inks
Javelle water	Sodium thiosulphate, for re-
Lemon juice and salt	moving iodine
Oxalic acid	

Bleaches (figure 5) are substances which whiten or remove color; hence, although often effective in taking out stains, they can be used successfully on colored fabrics only with discretion. They should not be used on colored fabrics without first testing to see their reaction on the color. The bleaches listed are chemicals, except sunlight, which also has a chemical reaction. The bowl method of application is best (page 23). The work should be done as rapidly as possible; and rinsing after each application should be thorough, for chemicals should never be allowed to dry on a fabric. Neutralizing a bleaching agent frequently is necessary (page 21). If, after thorough rinsing, the stain has not disappeared, bleaching should be repeated, always keeping in mind the fact that many short applications are better than one long one. When using any bleach, it is desirable to work as rapidly as possible.

Sunlight is the simplest and safest bleach to use, but it is difficult to confine to a small stained area.

Acetic acid is a clear, colorless liquid with a pungent odor. Vinegar contains from 4 to 5 per cent of acetic acid.

Ammonia in ordinary household solution should never be used for removing stains because it frequently contains soap or other ingredients that may hinder the action of the ammonia on the stain, or, if used hot, it may make spots on the material. A chemically pure 10-per-cent solution of ammonium hydroxide, purchasable at a drug store, may be used on some colored fabrics without changing the color, but it is wise to try it on an unexposed part of the garment first. With delicate fabrics, it is best to dilute the solution to one-half strength.

Borax is a white crystalline powder used as a cleaning agent. It is a mild bleach and may be used on any material with safety.

Chloride of lime is a white bleaching powder used in making Javelle water and many commercial bleaches.

Javelle water, one of the most commonly used bleaches, can be used only on white cotton and linen, since it removes color from dyed fabrics. It should not be used on colored materials unless the color has been tested. It cannot be used on woolen or silk materials because it injures animal fibers. To remove stains, full-strength Javelle water should be applied with a medicine dropper. If the odor of chloride of lime remains after its use, the spot should be rinsed with a solution containing 1 tablespoonful of ammonia to 2 quarts of water. This is not a neutralizing agent but an agent to overcome odor. Javelle water may be bought at a drug store, but it is much cheaper to make it at home.

Recipe for Javelle water

1 pound washing-soda crystals	$\frac{1}{2}$ pound chloride of lime
1 quart boiling water	2 quarts cold water

To the washing-soda crystals in an enameled utensil, add the boiling water. Mix the chloride of lime and cold water in another enameled dish. Combine the two mixtures and let them stand for several hours to settle. Pour the clear liquid off from the sediment, or strain the liquid through

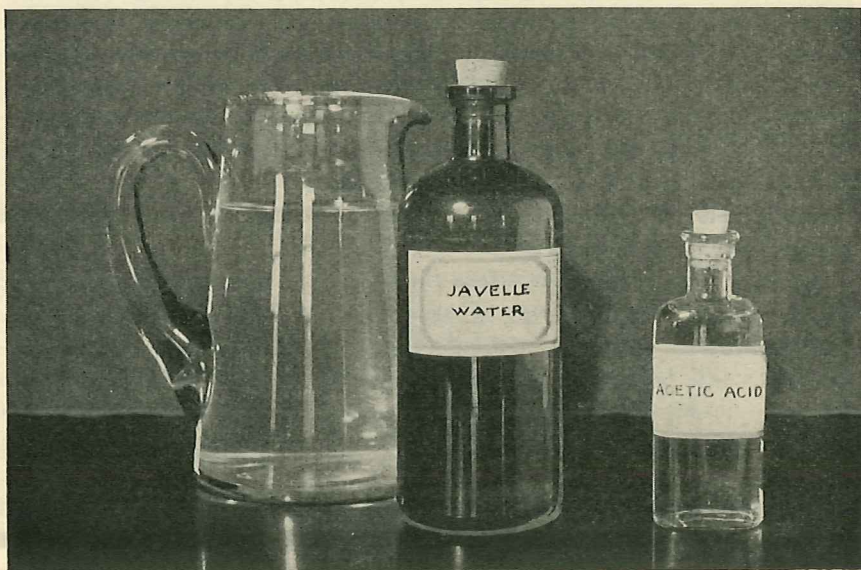
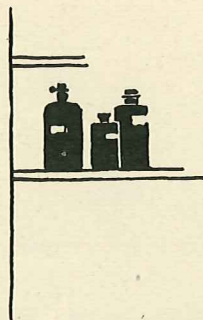


FIGURE 6. AN ALKALINE SOLUTION, WITH A NEUTRALIZER, FOR SPOT OR STAIN REMOVAL

When an alkaline solution, such as Javelle water, is used for spot or stain removal, an acid should be employed as a neutralizer

a thick cloth, then pour it into dark bottles and keep the bottles corked tightly.

Javelle water deteriorates with time, therefore it should be made in quantity not larger than that given in the recipe. It is most effective when used hot. After removing a stain with Javelle water, a neutralizing agent should be applied (figure 6), followed by thorough rinsing. Two tablespoonfuls of a 5-per-cent solution of acetic acid added to 1 gallon of water makes a good neutralizer for Javelle water. Sodium thiosulphate also is effective in removing the chlorine which remains in the fabric after using Javelle water. It should be followed by thorough rinsing. (See formula on page 18.)



A combination of **lemon juice and salt** makes an effective bleach for white fabrics. If salt moistened with lemon juice is put over a stain and the fabric is placed in the sunshine, the effect of the bleach is increased.

Oxalic acid is a poison. *It should be so marked and kept in a safe place.* Oxalic acid may be obtained in crystal form at a drug store, and a safe solution may be made by dissolving 1 teaspoonful of the crystals in 1 cup of hot water. The method for the use of oxalic acid (figure 7) in removing stains depends upon the stain and the fabric (see *Specific Stains*, page 27) but, in general, its action is quicker if a hot solution is used, employing the bowl method (page 23). Oxalic acid should never be allowed to dry on a fabric, but should be thoroughly rinsed out after being neutralized (page 21).

Peroxide of hydrogen, a mild bleach, may be used on silk and wool. As it may affect some dyes, it is safest to try it first on an unexposed part of the garment. The action is quicker if a few drops of ammonia are added just before used. One teaspoonful of ammonia should be used to 1 cupful of peroxide. It should be made fresh each time it is used.

Potassium permanganate is a poison. *It should be so marked and kept in a safe place.* Potassium permanganate may be purchased at a drug store in crystal form, then prepared as a solution at home, adding 1 teaspoonful of the crystals to 1 pint of water. This reagent cannot be used on colored fabrics, nor can it ever be used alone because then it leaves a brown stain on the ma-



KEEP POISONS OUT OF
REACH OF CHILDREN



FIGURE 7. ACIDS, WITH A NEUTRALIZER, FOR SPOT OR STAIN REMOVAL

When an acid, such as oxalic acid, is used for spot or stain removal, an alkali is employed as a neutralizer

terial. On cotton, linen, and silk, potassium permanganate should always be followed by oxalic acid; on wool, by peroxide of hydrogen, with thorough rinsing after each application. Potassium permanganate should always be used with great care. It should not be used on rayons.

Salts of lemon, a white crystal or powder, may be purchased at a drug store. Its use is discussed under *Specific Stains* (page 27).

Sodium hydrosulphite is a bleaching agent used in stain removal. It is bought as a powder, and it may be used in that form, moistening it and working it over the stain with the fingers; or it may be dissolved in warm water, 1 teaspoonful to 1 cup of warm water, and this solution used for immersing the stained fabric. A third way is to put some of the powder on the stain and to pour water through the stain. This is effective in removing dye and many stains not greasy in nature, but it cannot be used on colored materials unless the treatment is very rapid and the fabric is well rinsed after each application. Even so, color is often removed with the stain. In general, sodium hydrosulphite is used in the same way as oxalic acid (page 19). The powder should be kept in a tightly-corked bottle or container. A fresh solution should be used each time.

Sodium thiosulphate ("hypo"), a whitish crystalline substance, is used in removing iodine stains. It is also effective in removing the chlorine that

remains in a fabric after using Javelle water. For such use, a solution is made containing

$\frac{1}{4}$ ounce sodium thiosulphate
 $\frac{1}{8}$ ounce 36-per-cent acetic acid
2 quarts water

Action of acids and alkalis on fibers

All fibers are injured by strong concentrated acids, but they are not destroyed by weak or dilute acids if care is exercised. Strong alkalis and alkaline solutions, such as Javelle water, injure animal fibers, but vegetable fibers including rayons, except those made by the cellulose-acetate process, are not affected by them (page 12). The effect of either an acid or an alkali is more pronounced if concentrated or if it is allowed to dry on the fabric; therefore, in stain removal, it is necessary to follow such use with a neutralizing agent and to rinse the material thoroughly. For instance, after the use of an acid such as oxalic acid, an alkaline solution, such as ammonium hydroxide, is used to neutralize the acid and then the material is thoroughly rinsed. Likewise, if Javelle water, an alkaline solution, is used, it should be followed by acetic acid, after which the material should be thoroughly rinsed to remove it.

In using acids and alkalis, their effect upon the color of the material must be considered as well as their action upon the fiber, for many such strong reagents take out color. It is advisable to test the material for color before attempting stain removal (pages 7 and 8).

Other alkaline materials in the household besides ammonia are borax, baking soda, and washing soda. These react with acid, and are thus prevented from reacting further upon the fabric.

Common acids found in the home that may be used to neutralize alkalis are vinegar, lemon juice, and oxalic acid.

METHODS OF REMOVING STAINS

Pad, or sponging, method

The pad, or sponging, method is effective in general for removing stains that dissolve readily and is particularly satisfactory in removing grease stains. Surface dust and dirt should be carefully brushed off the garment before

The method used is important.

the sponging method is start-

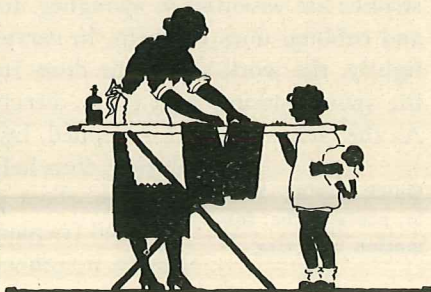




FIGURE 8. THE PAD METHOD OF SPOT AND STAIN REMOVAL

When a solvent is used, the pad method is employed. The pad absorbs the staining substance

ed. Then a heavy absorbent cloth or a clean blotter should be placed beneath the stain, with the right side of the stain down. The absorbent cloth acts as a wick in drawing out the solvent (figure 8) and the dissolved soil from the fabric; the cleaning fluid may evaporate but the staining substance must be given a place to go. This pad also prevents the cleaning substance from spreading over a wide surface of the material and helps to prevent the formation of a ring. The sponging cloth is then lightly moistened with the cleaning solvent and covered with one or two layers of dry cloth before one begins to sponge. Very light strokes are essential in sponging, for a gentle touch is all that is needed and rubbing does not help. In carrying the sponging cloth over the spot lightly, the work should be done from the outside toward the center of the spot, tapering it in every direction to prevent a ring from forming. As the cleansing fluid is applied, light blowing on the spot aids in quick drying, thus helping also to prevent a ring (figure 9). The absorbent pad and the cleaning cloth should be changed frequently as the stain dissolves and is taken up by it, otherwise the staining substance may go

Quick drying helps to prevent the formation of a ring.



FIGURE 9. BLOWING ON THE SPOT AS THE REAGENT IS APPLIED, TO PREVENT THE FORMATION OF A RING

In removing a spot by the pad method, blowing on the spot as the reagent is applied aids quick drying and helps to prevent the formation of a ring

back into the original fabric. Care should be taken not to roughen the fabric through too vigorous treatment.

Bowl method

The bowl method is specially effective for stubborn stains that require the use of chemicals. The stained portion of an article is first loosely stretched over a bowl containing lukewarm water, and is held in place with a rubber band. Then the spot is moistened with cold water to prepare the way for the reagent if it is soluble in water. The reagent is then applied to the spot, a drop at a time, and immediately followed by water

Use a separate dropper for each chemical and for water.

from another dropper (figure 10). Separate droppers should be used for each reagent and for water. The chemical should be used sparingly, and always followed by water. Many short applications are surer and safer than is one long-continued use of a reagent. An acid chemical, such



FIGURE 10. THE BOWL METHOD OF SPOT AND STAIN REMOVAL
The bowl method is used for bleaches

as oxalic, should be neutralized with an alkali, such as ammonia; but, if an alkali is first used, then an acid should follow (page 21). Thorough rinsing should always follow.

Formation and removal of a ring

Formation of a ring

The formation of a ring is one of the greatest difficulties of stain removal.

Rings are formed because of one or several of the following reasons:

The stained area is cleaned and the rest of the garment shows the soil.
The dressing in the material is removed or floated back.

The texture of the material is changed, owing to the tightening of the fibers.

The solvent may be impure.

The solvent may have been incorrectly manipulated.

Too much solvent may have been used.

The solvent has not evaporated quickly enough.

The dissolved grease of a grease stain has not been fully flushed out.

Rings may be avoided by:

Using an absorbent cloth or blotter beneath the stain.

Avoid rings in stain removal. Using straight, light strokes, beginning in the area around the stain and working toward the stain and using patting motions on the stain.

Using the solvent sparingly.

Drying quickly. Blowing on the stain as the solvent is being applied helps to dry it (figure 9).

Using a dry cloth to absorb excess moisture after each application of the reagent.

Using a piece of the same material in applying the reagent as that on which the stain occurs.

Being sure that the stain is all out before stopping the process.

Working rapidly when applying the reagent.

In removing grease stains, by making a paste of a mixture of fuller's earth and carbon tetrachloride and spreading it over the spot. After drying thoroughly, the mixture is brushed off and the procedure is repeated if necessary. This method, preventing the spreading of the solvent and the formation of a ring, is particularly useful for light-colored unwashable materials.

Removal of a ring

If ringed material is placed right side up over a clean section of the pad and the edge of the ring is rubbed lightly with the fingernail or the edge of a spoon or coin (figure 11), the ring may disappear. If it does not, rubbing the fabric between the hands may be efficacious. Materials with a crepe weave often respond to this treatment.

Steaming is also effective in ring removal. A small quantity of water is boiled in a tightly closed teakettle, the spout of which is covered with a piece of cheesecloth tied on to prevent water drops from escaping and spotting the fabric. The ringed spot is held over the spout from which the steam is escaping (figure 12) just long enough to become moist, not wet. The material is then shaken dry and pressed.

Rings do not show so plainly on rough or figured fabrics as on smooth and plain-colored materials.

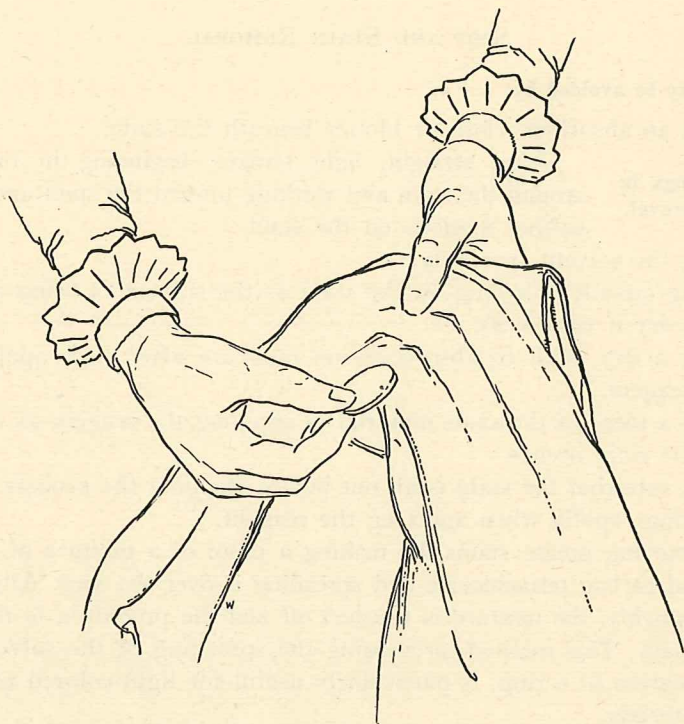


FIGURE 11. REMOVING A RING BY RUBBING THE SPOT WITH A COIN

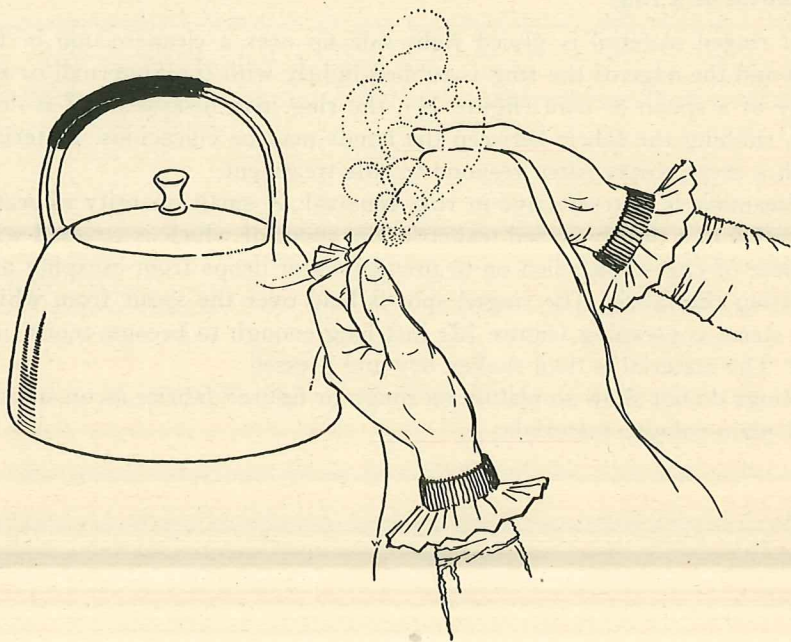


FIGURE 12. STEAMING THE SPOT TO REMOVE A RING

EFFECTS OF CHEMICALS ON DYES AND FIBERS

The effects of chemicals on dyes and fibers are listed in the following table:

Chemicals	Effect on fibers	Effect on dyes
Acetic acid (28 per cent)	None	Takes out some colors
Alcohol (inflammable)	Affects cellulose acetate	May affect some dyes
Ammonium hydroxide	None	Takes out some colors
Amyl acetate	If not pure, may effect cellulose acetate	Takes out some dyes
Borax	None	Takes out some dyes
Carbon tetrachloride	None	Practically none
Chloride of lime	Injures animal fibers	Affects most dyes
Chloroform. (Use not advised)	Dissolves cellulose acetate	Affects some dyes
Detergent	None	May affect some dyes
Ether (inflammable). Use not advised	Dissolves cellulose acetate	Affects some dyes
Gasoline, naphtha (highly inflammable). Use not advised	None	May affect some dyes
Glycerine	None	None
"Hypo"—sodium thiosulphate	None	None
Javelle water	Affects animal fibers	Bleaches
Kerosene	None	None
Oxalic acid	Injures fibers if allowed to dry on them	Bleaches
Potassium permanganate	Injures fibers if not rinsed out	Bleaches
Salts of lemon	Injures fibers if not rinsed out	May affect colors
Sodium hydrosulphite	Discolors weighted silk	Bleaches dyes
Sodium thiosulphate	See under "Hypo"	
Turpentine	None	May affect some dyes
Vinegar (contains 5-per-cent acetic acid)	None	Takes out some color
Water	None	May affect color

SPECIFIC STAINS AND METHOD OF REMOVAL FOR EACH

The methods and reagents for specific stains are found in the leaflets and bulletins that may be obtained from the government and from commercial firms, either free or at a small charge. Every homemaker should have one or more of these booklets handy so that she can find them at a moment's notice. A list of leaflets and books is given on page 49.

Directions for removing a few of the common stains follow, but the specific treatment depends upon the kind of stain and the type of fabric (pages 28 to 48). It should be remembered that each stain is an individual problem and must be treated as such.

Acids

Acid stains change the color of dyed material and weaken the fibers.

First remove with water or neutralize with ammonia by holding the spot over an open bottle of strong ammonia solution.

Sprinkle baking soda on both sides of stain, moisten with water, and allow mixture to stand until bubbling ceases. Rinse with water.

Acids from batteries

Wash the spot with warm water, using 3 teaspoonfuls of household ammonia to 1 quart of water. Allow to stand for one minute. Rinse with cold water. Repeat to be sure all traces of the acid have been removed.

Adhesive tape

Apply kerosene or carbon tetrachloride to an adhesive-tape stain. Then wash the stain with warm suds.

Alcoholic beverages

Spilled on table linen, alcoholic drinks soak through the cloth and dissolve the varnish or finish of the table, leaving a stain on the cloth. Often these stains may be successfully removed by first rubbing them carefully with alcohol to dissolve the varnish or shellac and then bleaching any remaining color by soaking the spot in heavy suds to which peroxide of hydrogen has been added in the proportion of 1 tablespoonful to 1 gallon of suds. A second method is to bleach the stain with Javelle water. This applies to white cotton and linen only.

Light sponging with luke-warm water usually will remove fresh wine stains from silk.

In removing a stain made by wine, follow the directions for fruit stains (page 32) if the material is washable. For colored goods, sponge with ammonia, testing first for color fastness. For silk, sponge with ammonia water, testing first for color fastness, then sponge with luke-warm water.

Alkali stains

Yellowish spots made by alkaline substances often result from the careless use of washing soda, lye, alkaline soaps or from insufficient rinsing. When these spots do not yield to cold water, they will often respond to applications of mild acids, such as lemon juice, vinegar, or oxalic-acid solution, followed by thorough rinsing.

Argyrol

Use soap solution followed by ammonia or "hypo" (sodium thiosulphate) crystals (page 20).

Automobile grease. See page 35.

Blood

Blood stains on washable material may be removed by soaking them, until the coloring matter is dissolved, in cold water to which household ammonia has been added in the proportion of 1 tablespoonful to 1 gallon of water. Then wash the article in lukewarm suds.

Rub the spot with cold water, or pour ammonia on the spot. Rinse with clear water.

Fresh stains on silk and wool may be removed by sponging them with cold or lukewarm water if water can be used on the fabric. If any traces remain after using water, sponge the spot with peroxide of hydrogen.

To remove the yellow stain left after the redness of blood has disappeared, moisten the stained portion with soap suds and then steam it.

For stubborn stains, soak them in a fairly strong salt solution, about 1 cupful of salt to 2 quarts of water.

For blood stains on thick materials, such as blankets or mattresses, make a starch paste of raw starch and cold water. Apply the paste to the stain and brush it off as it dries. Repeat the process until the stain is removed. If the blood has dried, sponge the spot with peroxide until the stain disappears. Follow with water.

Bluing

Bluing may come out in the laundry. Rinse the spot in cold water or soak it in a solution of 1 tablespoonful of vinegar to 1 quart of warm water.

Butter. See page 35.

Candle wax

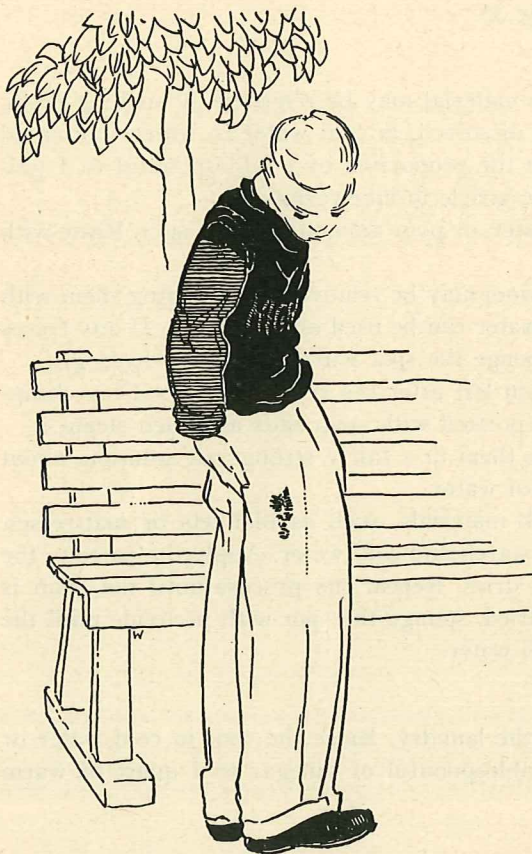
Scrape off as much of the wax as possible. Place a blotter beneath and above the stain and press it with a hot iron to remove the solid wax. Remove the remaining grease with carbon tetrachloride. If any color is left, it may be removed by alcohol or peroxide of hydrogen.

Rub the spot with cold lard or turpentine, and then wash the spot with warm suds.

Another method is to apply kerosene and then wash the spot.

Carbon paper

Carbon-paper stains are made more difficult to remove if they are first wet with clear water, therefore use soapy water on them immediately. White cotton and linen may be boiled in heavy suds. Unwashable and colored materials may be sponged with denatured alcohol, using the pad method to absorb the stain and the excess moisture.



with a few drops of ammonia.

A third is to cover the spot with borax and soak it in cold water.

If the article is not washable, sponge the stain with warm water. If a grease spot remains, remove it with a grease-dissolving agent such as carbon tetrachloride.

Cod-liver oil

Fortunately, cod-liver oil is an easy stain to remove when new, hence the best time to remove it is as soon as it appears or before laundering. Place the stained portion over a pad and apply carbon tetrachloride liberally to the stain. The pad absorbs the oil as the carbon tetrachloride dissolves it. Repeat this process until the oil is removed. While the carbon tetrachloride is still in the article, wash it with soap and water, giving special attention to the stained part.

Another solution that may be used on either white or colored materials is the following: Mix 1 tablespoonful of soap flakes with 2 table-

Chewing gum

Scrape off as much of the chewing gum as possible, then apply carbon tetrachloride, using the pad method. Or scrape off as much of the gum as possible, then soak the spot in kerosene, and finally wash it in hot suds.

Another method is to rub the spot with ice until the chewing gum rolls into a ball, then scrape it off.

Cocoa and chocolate

For washable materials, wash them in soap and water while the cocoa or chocolate stains are fresh. If a brown stain remains, remove it with peroxide of hydrogen or Javelle water.

A second method is to soak the stain in wood alcohol made alkaline

spoonfuls of boiling water. Add 2 tablespoonfuls of amyl acetate (banana oil) after the mixture of soap flakes and water begins to thicken. Rub this mixture on the stain. Cod-liver oil clings to fabrics and thorough rubbing is necessary to remove the stain completely. After the oil has been rubbed away, the garment should be laundered in warm suds.

When cod-liver-oil stains have been laundered, they are difficult to remove because the washing and ironing process has "set" them and a brown stain appears. The stain is almost impossible to remove. However, stains in white cotton and linen may sometimes be removed by boiling the garment in a solution of 1 gallon of soap suds to which 1 tablespoonful of peroxide has been added. Let the suds come to a boil before adding the peroxide. Repeat the process if necessary.

Cream sauces

Sponge the stain with lukewarm suds. On unwashables, sponge with carbon tetrachloride to remove grease. Then sponge it with a cloth moistened with lukewarm water to remove starch.

Dye stains

Dye stains are difficult to remove. An efficient reagent is sodium hydro-sulphite (page 20). Let the stained portion remain in the solution until the dye disappears. Rinse and add a few drops of ammonia to the last rinse water.

Stains caused by the bleeding of a colored material into white cotton or linen may often be removed by boiling the material in heavy suds, although the ease with which such stains can be removed depends entirely upon the nature of the dye.

Egg

Scrape off as much as possible of the egg. Then wash or sponge the spot with cold or lukewarm water. Finally launder wash materials in warm suds.

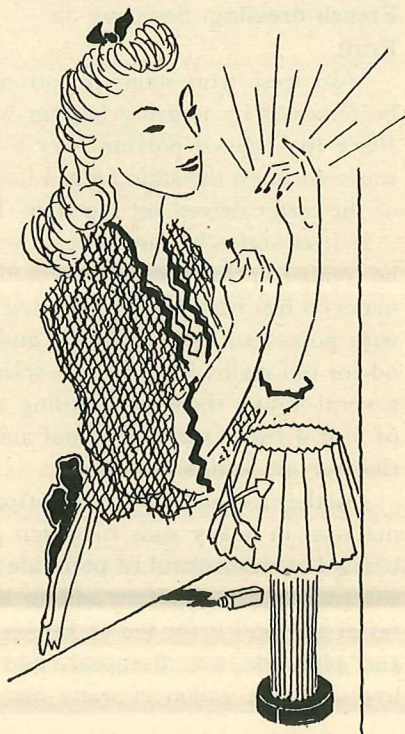
Fingernail polish

Apply amyl acetate or the following preparation which is used by cleaners for removing fingernail polish:

2 ounces pure amyl acetate (banana oil)

1 ounce benzol

½ ounce denatured alcohol to which a few drops of ammonia have been added



This mixture will dissolve rayons made by the cellulose-acetate process, therefore one must be sure of the material before applying the mixture.

Cover with nail-polish remover. When soft take up surplus with soft cloth; then sponge with denatured alcohol to which has been added a few drops of ammonia.

Fly paper

Sponge the spot with a soap solution or bubble cleaner.

Rub the fly-paper spot with kerosene, then wash it in suds and rinse it in clear water or apply carbon tetrachloride.

Foliage

Foliage contains a green coloring matter that is easily removable. For washable materials, use a warm soap solution and rub the spot between the fingers. If a yellow stain remains after this treatment, the spot may be removed by bleaching with Javelle water.

If the material is not washable, sponge the spot with a solution of denatured alcohol and water mixed in equal proportions, using the pad method. To prevent a ring, brush the alcohol irregularly into the fabric and dry quickly.

An old method for grass stains that has been found effective in many cases is to rub the stain with molasses, then wash the spot.

French dressing. See page 35.

Fruit

Most fresh-fruit stains in cottons and linens, if treated while fresh, can be removed by pouring boiling water from a height through the stain. Place the stained portion over a bucket on the floor, then pour boiling water through the stain from a height of 3 or 4 feet (figure 13). The force of the water drives out the stain. Do not use soap, as soap sets the stain.

If fruit stains become dry, they are more difficult to remove, but should be treated in the same way as a moist stain. If fruit stains are old or the material has been laundered, they may be bleached with Javelle water or with potassium permanganate and oxalic acid (page 19). Another method for old stains is to rub the stain well with glycerine, let this stand for several hours, then pour boiling water through the stain from a height of 3 or 4 feet. Oxalic acid and ammonia used alternately are often effective for old stains.

Another method for white cotton and linen fabrics is to boil the stained material in heavy suds to which peroxide of hydrogen has been added, using 1 tablespoonful of peroxide of hydrogen to 1 gallon of suds. Bring the suds to a boil before adding the peroxide. Then add the stained material and boil it for ten or fifteen minutes. If stains such as peach, pear, and plum do not disappear, add another tablespoonful of peroxide of hydrogen per gallon of water and boil the material again.

If these stains are on silk, wool, or any colored fabric, spread the garment over a bowl filled with hot steaming water to which a few drops of ammonia have been added; then apply peroxide of hydrogen from a medicine dropper at about five-minute intervals. Whether or not this treatment will fade colors depends on the dye in the fabric, and can be determined only by trying the treatment on an unexposed part of the material. If the stain is old and has become dark, apply alternately dilute acetic acid (page 17) or vinegar and boiling water.

Purplish stains like blueberry or plum should be moistened with lukewarm water and rubbed to get rid of the surface; then boiling water is poured through the stain from a height. Be sure to remove all the stains before it comes in contact with soap and water, as soap may set the stain, especially if it is an alkaline soap.

These same methods may be used for cooked-fruit stains. Stains from cooked fruit can be removed with boiling water (figure 13) or with ordinary laundering.

Grape juice

To remove grape-juice stain, pour boiling water

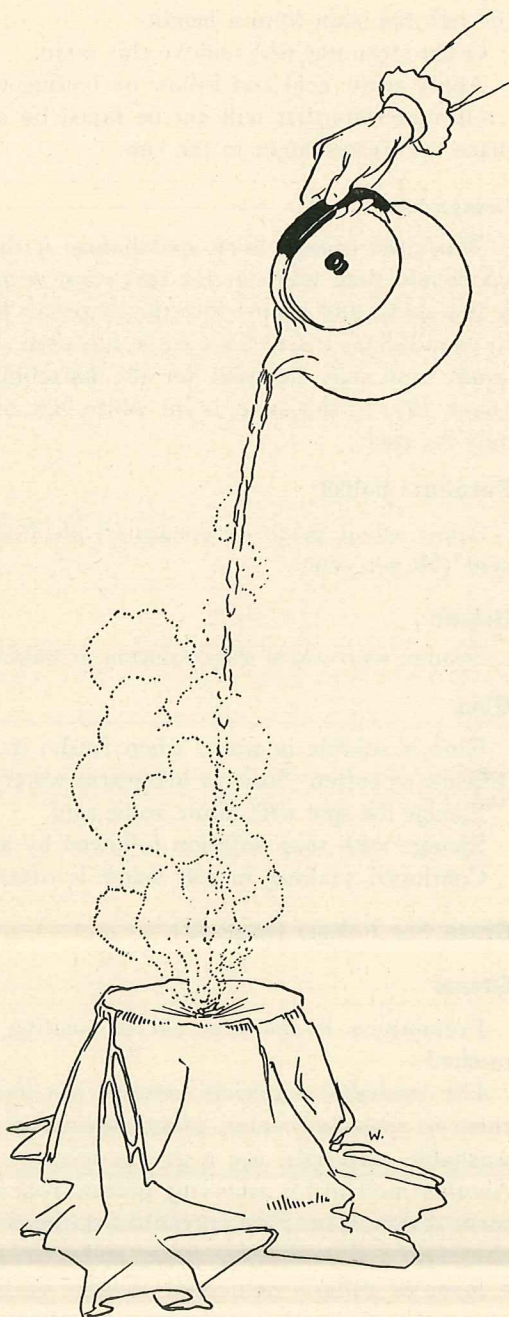


FIGURE 13. REMOVING A FRUIT STAIN
The force of boiling water poured from a height drives out the stain

through the stain from a height.

Often steaming will remove this stain.

Apply acetic acid and follow by boiling water.

On materials that will not be faded by sunlight, try lemon juice and place the treated stain in the sun.

Orange juice

Wash the orange-juice spot before it dries, or soak it in lukewarm water and then wash it, for this stain is more difficult to remove after it is washed and ironed into the material. If an orange-juice stain is set by laundering, it will have to be bleached. Potassium permanganate and oxalic acid may be used for the bleaching, but on white goods only (page 19). If the stain is on white silk or wool, sodium hyposulphite may be used.

Furniture polish

Apply equal parts of denatured alcohol, acetone, and glacial acetic acid (99 per cent).

Gelatin

Sponge with warm soap solution or bubble cleaner.

Glue

Glue is soluble in water when fresh; if thoroughly dried, it is often difficult to soften. Soak in lukewarm water for one-half hour or longer.

Sponge the spot with dilute acetic acid.

Sponge with soap solution followed by ammonia.

Continued soaking in salt water is often effective.

Grass. See *Foliage* (page 32).

Grease

Promptness is the first aid in treating grease stains. Use the pad method.

For washable materials, remove the fresh grease stains by washing them in soap and water, giving special attention to the spot. For non-washable materials, use a grease solvent such as carbon tetrachloride. Another method for removing grease from silk and wool is to use fuller's earth and an iron. First spread the garment on an ironing board, with an absorbent pad or blotting paper under the garment. Cover the spot with a layer of fuller's earth and another of porous paper. Iron the paper above the spot with a warm iron for about five minutes. Then brush the spot clean, repeating the treatment if necessary.

Automobile grease

Automobile grease will usually come out when the garment is laundered if the spots have first been treated with carbon tetrachloride. For non-washable materials, sponge them with carbon tetrachloride, using the pad method.

Black grease (Tarvia or road oil)

Scrape off as much of the grease as possible, rub the spot with lard until the lard is discolored and until the spot is softened. Repeat this procedure if necessary, then wash the stain in heavy suds.

Scrape off as much of the grease as possible, sponge the spot with carbon tetrachloride, and then wash the spot.

If the material is not washable, sponge the spot with carbon tetrachloride.

Butter, fats, and oils

Sponge the spot with carbon tetrachloride if the material is not washable.

French dressing

Sponging the spot with cool water will flush out the vinegar. Let the material dry, then use carbon tetrachloride to eliminate the grease.

Lubricating grease

If these lubricating-grease stains contain dust, dirt, or bits of metal, scrape off as much of this as possible, then brush the stains to remove any excess dirt. Treat the spots with carbon tetrachloride or chloroform until all traces of grease have disappeared. If the stain is on washable fabric, rub it well with lard, scrape off the lard, repeat the treatment, then wash the spot in warm, soapy water. The article should not be washed until all



traces of stain have gone. If washed before treatment, a yellow stain remains that is almost impossible to remove.

If the grease is on unwashable fabric, use an absorbent: fuller's earth or magnesia for fine fabrics, cornmeal or salt for carpets and rugs. This method is effective only for spots of grease or oil unmixed with particles of dirt or metal.

Machine oil

Cover a fresh machine-oil stain with fuller's earth or any absorbent. Brush off as stain is absorbed.

Sponge with carbon tetrachloride.

Mayonnaise

Sponge mayonnaise spots with cool water to remove the egg; then sponge out the oil with a grease solvent, using the pad method.

Milk and cream

Soak a milk-and-cream spot in cold water first to remove the protein, then wash it in hot soap suds to remove the fat. For unwashable materials, sponge the spot with carbon tetrachloride, allow it to dry, then sponge it with lukewarm water.

Olive oil or cotton-seed oil

Often the brownish spots that appear on table linen are caused by salad oils. When a tablecloth stained with salad oil goes to the laundry with the spots on, the heat of the wash water and the heat of the iron may cause the oil to become set and to appear as a brown spot. This may be removed by soap and water applied directly to the spots, or by soaking the spots for fifteen minutes in a solution of $\frac{1}{4}$ cupful of washing soda in 1 cupful of water, added to 1 gallon of lukewarm water.

Salves

Salves used in home remedies usually contain grease. Sponge washable material with carbon tetrachloride and then wash the spot in soap and water. Unwashable material should be sponged thoroughly with carbon tetrachloride.

Tar, pitch, wagon grease

Rub the grease spot well with lard, scraping off and repeating as it becomes discolored, until the lard comes off clean. Then wash the spot in heavy suds. Tar is sometimes permanent and cannot be removed.

Ice cream

Ice cream leaves a sugary spot with protein in it which may be removed with cool water. For the remaining grease, treat the spot with carbon tetrachloride, and for any remaining color caused by fruit, treat the spot as for any fruit stain (page 32).

Use bubble cleaner on the spot, and then rub the spot with carbon tetrachloride.

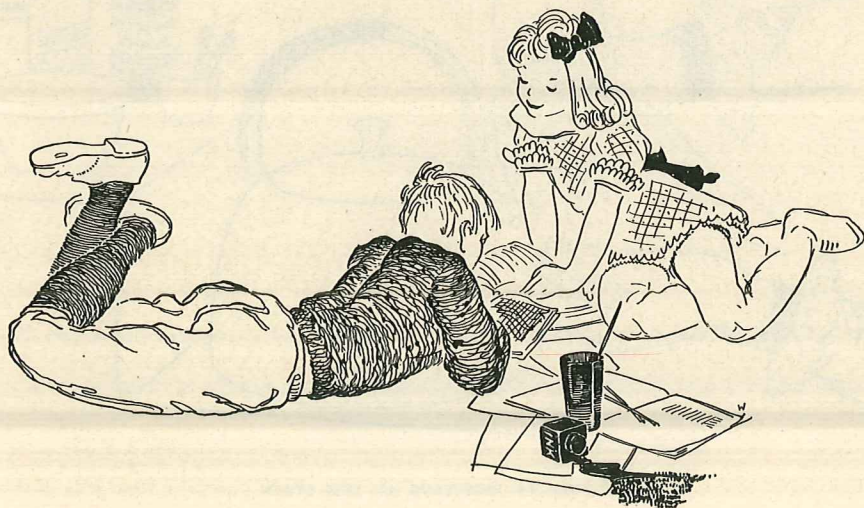
Indelible pencil

Indelible pencil is a difficult stain to remove, but it may sometimes be washed away with soapy water. Do not put the stained material in clear water first as this spreads the dye. Or, sponge the stain with ammoniated alcohol, made by adding 6 drops of spirits of ammonia to $\frac{1}{2}$ cupful of alcohol. Use the pad method, then wash the spot in soap and water. A persistent stain may yield to chloroform.

Ink

Since each of the various kinds of ink has a different chemical composition, it is impossible to give a method that will be effective for all kinds. If the stain is very fresh and the material is washable, wash the stain with soap and water. An effective method for white fabrics is to moisten the stain with lemon juice and place the treated stain in the sunshine, repeating this procedure until the stain disappears. Potassium permanganate and oxalic acid may be used on delicate fabrics as well as on ordinary ones if care is taken (page 19).

A safe method for colored materials is the old one of soaking the stain



in milk until the milk becomes sour. Milk that has been pasteurized is usually not so effective as is raw milk, and always, after the ink is gone, a milk stain is left to deal with (page 36).

Still another method that is often successful is to sponge the stain with a soap solution, then to apply a few drops of peroxide of hydrogen with a medicine dropper. Steam (figure 14) the spot until the color turns yellow (from 1 to 2 minutes). Rinse the spot in warm water, then apply 1 or 2 drops of oxalic-acid solution. Steam again if the stain does not disappear, but do not prolong steaming, as oxalic acid is destructive at high temperatures. Repeat the process until the stain disappears. Rinse the material thoroughly, adding a few drops of ammonia to the last rinsing water.

Commercial ink removers may be used successfully if the directions are followed and the remover is thoroughly rinsed out.

If ink or grease has been spilled on a rug, immediately cover the spot with an absorbent such as fuller's earth, cornmeal, or salt to take up as much as possible before it soaks in. Brush the absorbent off as quickly as it becomes discolored. After this initial treatment, if the spot is grease, remove the grease spot as directed on page 34. If it is ink, apply a paste of fuller's earth and water, let this dry, then brush it off. This may re-

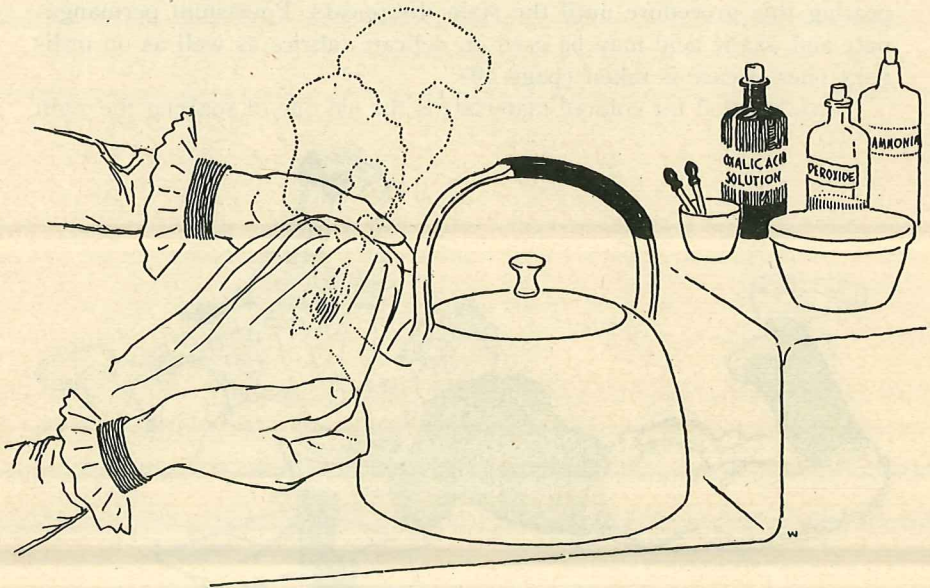


FIGURE 14. REMOVING AN INK STAIN

Peroxide, oxalic acid, and steam help to remove an ink spot

move the color of the rug if the rug material is not fast color.

Other treatments for ink that are effective in many cases are: ammonia followed by vinegar; oxalic acid followed by ammonia; hydrogen peroxide followed by baking soda, or a paste of peroxide of hydrogen and soda spread on the spot (steam the spot while the paste is on it). This latter method is effective for silks and wools, though precautions as to the removal of color must be taken (pages 7 and 8). Dry mustard and water left on the stain for twenty-four hours is an old remedy that may be tried on colored materials.

Ink on rugs

Saturate the spot with baking soda: 3 tablespoonfuls to 1 quart of warm water. Use a clean cloth to wipe this off. This treatment may remove the color.

Use salt to absorb ink. Brush dissolved salt away; apply lemon juice; thoroughly rinse the spot with water.

Red ink

Sponge the spot with peroxide, and then rinse it with cold water.

Printer's ink

Apply sodium hydrosulphite to the ink stain (page 20).

Iodine

Fresh iodine stains may be removed from washable materials with soap and water, or the stain may be moistened with water and placed in the sun or over a warm radiator.

"Hypo" (sodium thiosulphate) is an effective remedy for iodine stains. Make a solution of 1 tablespoonful of "hypo" to 1 pint of water. Apply this solution to the stain, then wash the article.

Sponging the stain with ammoniated water is often effective. Add 6 drops of spirits of ammonia to $\frac{1}{2}$ cupful of water. For unwashable materials, sponge the spot with alcohol first, then follow with ammonia. Sometimes the stain may be steamed out. For heavy materials, apply a paste of starch and ammonia, brushing the paste off as it dries. Repeat this process until the stain disappears.

A paste of warm water and laundry starch is also effective.

Iodine on rug

First sponge the stain with denatured alcohol, followed by luke-warm suds made with a mild soap. Rinse well.

Iron rust

Any one of the following methods may be used to remove iron rust: Apply oxalic-acid solution (concentrated) to the material spread over

a bowl of hot water. Repeat this procedure until the stain disappears, following each application with a thorough rinse. Use a few drops of ammonia in the last rinse.

Or, place oxalic-acid crystals on the stain, then moisten the crystals with hot water. Rinse the material and repeat the process until the stain disappears. Neutralize the acid with ammonia, 2 tablespoonfuls to 1 gallon of water, then rinse.

Iron-rust soap may be used, following the directions on the package.

Salt, moistened with lemon juice, may be placed over the stain, and the fabric laid in the sunshine. Repeat this treatment until the stain is removed.

Lemon juice may be applied, followed by steaming.

Iron rust from bluing

Prussian blue, a substance containing iron, is often used in bluing. If the soap is not entirely rinsed out before the clothing or linen is put into the bluing water, iron-rust spots may appear. To determine whether the bluing is of this variety, add a soda solution to the bluing and shake the solution for a few minutes. If iron is present, the blue color changes to the reddish color of iron rust. These stains may be removed by any one of the methods given under *Iron Rust*.

Lipstick and rouge

Usually lipstick and rouge will disappear with ordinary laundering but some are set by soap. First sponge the spot with carbon tetrachloride. If the stains are stubborn, rub in a colorless grease such as white vaseline, then sponge the spots again with carbon tetrachloride, or bleach them with peroxide of hydrogen. For unwashable materials, sponge the stains with carbon tetrachloride, using the pad method (page 21), or sponge with denatured alcohol to which a few drops of ammonia have been added.

Lipstick on napkin

Rub the spot generously with soap before washing.

Mascara

Sponge the spot with carbon tetrachloride to remove the wax; then sponge with lukewarm suds or bubble cleaner.

Meat juice

Hot water sets meat-juice stains. Use cold water or the methods described for blood stains (page 29).

Medicine

Medicines vary in composition, hence it is not possible to give reagents for their removal. If the composition is not known, it is necessary to try different methods.

Wood alcohol may be used successfully in sponging out some medicine stains.

Mercurochrome

Mercurochrome stains frequently come out in laundering; but, if not, cotton and linen may be bleached with potassium permanganate and oxalic acid or Javelle water (pages 18 and 19). Colored materials are apt to fade in this process, and it is almost impossible to remove mercurochrome from silks and wools. Apply alcohol, followed by acetic acid, then by alcohol. Rinse with clear water.

Mildew

Mildew is a plant requiring darkness, warmth, and moisture for growth. It grows rapidly, and in the later stages so attacks the fiber of fabrics that it is almost impossible to remove the stain.

Often, fresh mildew may be removed by laundering and hanging the fabric in the sun to dry. Lemon juice, salt, and sunshine also are effective. For old stains, Javelle water may be used. Stretch the fabric with small spots of mildew over a bowl of hot water containing a few drops of ammonia, and apply Javelle water with a medicine dropper. Rinse the material in hot water, then neutralize the bleach with acetic acid, using 2 tablespoonfuls of the acid to 1 gallon of water. Rinse the material thoroughly. Potassium permanganate and oxalic acid also are effective in bleaching old mildew stains (page 19).

If the mildew spots are large, soak them for one-half hour in a solution of 1 part of Javelle water to 8 parts of water. Rinse them thoroughly, neutralizing the acid with 2 tablespoonfuls of ammonia to 1 gallon of water.

Mildew is difficult to remove from colored cottons and linens. If the stains do not come out with laundering, use a mild bleach, such as 1 teaspoonful of potassium permanganate to 1 pint of water, applying the bleach with a medicine dropper. The brown stain of potassium permanganate may then be removed with lemon juice or oxalic-acid solution.

For a mildew stain on white wool or silk, try laundering first. If unsuccessful, use a bleach of $\frac{1}{4}$ teaspoonful of potassium permanganate to $\frac{1}{2}$ cupful of water. Place the stain over a bowl of steaming hot water and apply the reagent with a medicine dropper. If the material is silk, remove the brown stain with 1 tablespoonful of oxalic acid in 1 cupful of

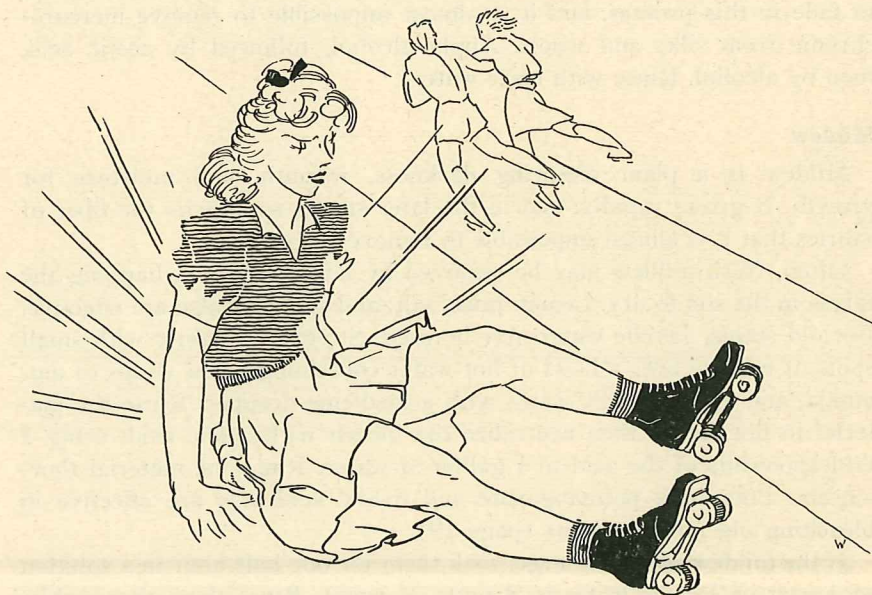
water. For woolen fabrics, remove the brown stain with peroxide of hydrogen. In either case, neutralize the acid with 2 tablespoonfuls of ammonia in 1 gallon of water. Follow by complete and thorough rinsing.

Mucus

Soak the stain in salt water, 2 tablespoonfuls to 1 quart of water. If very soiled, boil the garment in salt water in an enamelled pan.

Mud

Allow a mud stain to dry, then brush away as much of the mud as pos-



sible. If the material is washable, wash out any remaining stain with soap and water. For unwashable material, sponge the stain with denatured alcohol. Allow mud containing oil or grease to dry; then after brushing off all that will come away, sponge the spot with carbon tetrachloride until the stain disappears.

Mustard

Mustard often contains turmeric. Put the stain in a solution made of 1 tablespoonful of sodium hydrosulphite powder in a pint of warm water, or moisten the powder and apply it to the stain. Sponge the stain with denatured alcohol.

Paint or varnish

If the paint or varnish stains are fresh, apply turpentine, lard, or kerosene, then wash the stains in heavy suds. If the stains are old and dry, it requires patience and repeated applications to remove them and they are difficult to remove by home methods. Resinous materials in varnish may be dissolved by turpentine, chloroform, or wood alcohol. Soften the stain with amyl acetate, kerosene, turpentine, or lard (a time-consuming procedure); then apply carbon tetrachloride. When the oil in the paint is removed, the insoluble coloring matter will brush off.

Soak the spots in equal parts of ammonia and turpentine, and wash the spots in suds.

Paraffine

Scrape off as much as possible of the paraffine. Press the spot between two thicknesses of blotting paper.

Apply kerosene, and scrape off the paraffine as the kerosene is applied.

Pencil marks

Rub the marks with eraser first. If washable, use soap and water.

Apply carbon tetrachloride, using the pad method (page 21).

Perfume

On white materials, remove perfume spots by sponging with peroxide of hydrogen; on colored fabrics if the color has been removed by the alcohol in the perfume, nothing can be done.

If perfume has been spilled on a dresser cover, it is probable that the



alcohol has removed the varnish from the furniture and this stain has to be considered as well as the perfume. See *Paint or Varnish* (page 43).

Perspiration

Perspiration stains, which are normally acid, will generally wash out of washable material, but the dye may be affected so that the color is changed. If the color is gone, holding the stain over the fumes of a bottle containing ammonia may restore the color or it may be sponged with vinegar. If not, there is no way to bring the color back except by redyeing. Old perspiration stains may become alkaline through decomposition; acetic acid may restore the color. Follow the acetic acid with clear water. Old stains on white material may be bleached with peroxide of hydrogen, to which a few drops of ammonia have been added, applied with a medicine dropper over a bowl of steaming water, and then rinsing. A fabric that is not washable should be dry-cleaned, though this may not wholly return the color or remove the stain.

The odor of perspiration may often be removed by sponging with listerine.

Pitch. See page 36.

Rubber cement

Sponge the stain with carbon tetrachloride.

Scorch

Dampen the scorched area and lay it in the sun, though very little can be done to restore silk, wool, or any other material if the fibers are badly injured. With cotton material, moisten the scorched spot with water and lay the material in the sun, repeating this procedure if necessary.

Light scorch stains on cotton or silk may often be removed with peroxide of hydrogen. Dampen a cloth with this reagent, lay it over the scorched spot, then put a dry cloth over the dampened one and press this with a warm iron. Do not allow the iron to touch the cloth wet with peroxide of hydrogen. Light scorch on wool may be brushed with fine emery paper.

Shellac

Shellac is not soluble in the usual paint and varnish solvents but it may be dissolved in a solution of equal parts of denatured alcohol and water.

Shoe polish

If the shoe polish contains lamp black or wax, turpentine and carbon tetrachloride may be successfully applied. Rub the stain with lard and then wash the garment in suds. Tan shoe polish may be removed by

sponging the stain with wood alcohol.

Sponge with bubble cleaner.

Soft drinks

Since heat or soap will set soft-drink stains, sponge the spot with lukewarm water and denatured alcohol. Tannin, found in synthetic fruit juices and soda-fountain drinks, makes stains that are colorless and invisible at first. Soft-drink stains washed with soap and water or subjected to mild heat or even simply to dryness, change in composition, forming tan or brown stains. Often, fresh stains may be removed by the careful application of a solution of equal parts of glycerine and alcohol. Use the pad method (page 21).

A paste made of borax and water is often effective.

Soil on collars and cuffs

For general soil on collars, cuffs, neck and sleeves of dresses, and on the back of the neck of coats, use either carbon tetrachloride or a detergent, being sure to follow all rules. Place the article to be cleaned on an absorbent pad and brush the spot to remove dust and dirt (figure 15).

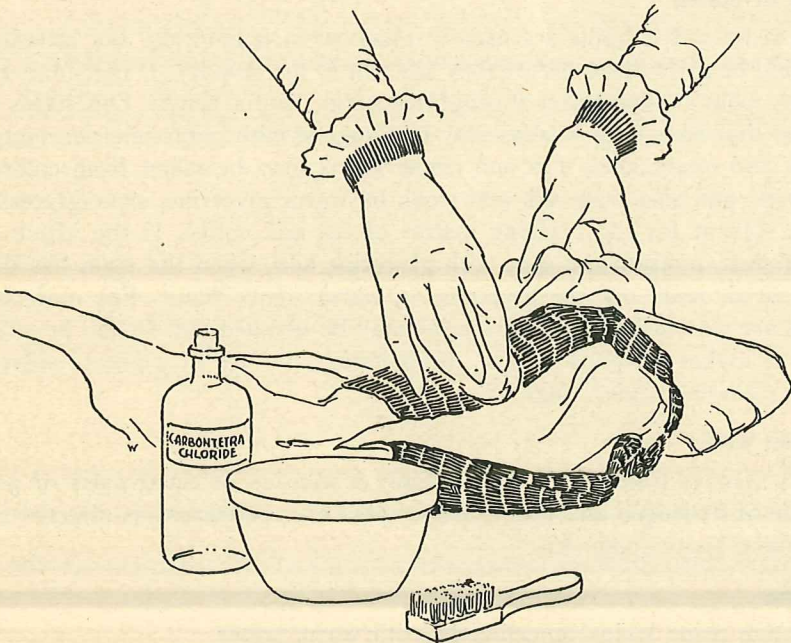


FIGURE 15. CLEANING A COLLAR

In removing general soil on collars, the pad method is used

Then brush the spot lightly with the reagent, using a small portion at a time. Using too much of the reagent with each application causes the soil to run down into the garment in streaks. Dry the spot after each application, remembering that many short applications are more effective than one long continued operation. If a detergent is used, work rapidly. Rinse the spot well with tepid water.

Soot marks

Soot marks consist of finely pulverized carbon. Brush the stain first, then cover it with an absorbent such as fuller's earth, cornmeal, or salt, brushing the absorbent away as it becomes soiled. This will remove most of a fresh stain. Then wash the material in soap and water. If the material is not washable, treat it with one of the absorbents mentioned, following with carbon tetrachloride in place of water.

Tar. See page 36.

Tarnish on metallic fabrics

Sprinkle the spots with borax or baking soda and rub gently with a soft cloth. Then brush off the remaining powder.

Tea or coffee

Tea or coffee stains are usually removed in laundering, but attention should be given them before they are sent to the laundry. If the stains are fresh, pour boiling water through the stain from a height. Old stains or those that have been washed may be bleached with potassium permanganate and oxalic acid. Tea and coffee stains may be taken from colored fabrics, and also from silk and wool, by warm glycerine, since glycerine is a solvent for the coloring matter of tea and coffee. If the article is color-fast, moisten the spot with glycerine and, when the stain has disappeared, wash out the glycerine in warm soapy water. For materials that are not washable, the glycerine may be steamed out. Cream in coffee or tea makes a complex stain, necessitating the use of a grease solvent (see *Complex Stains*, page 47).

Toilet water

To remove toilet-water stains, apply a solution of equal parts of peroxide of hydrogen and water. These spots may be treated as directed for perfume spots (page 43).

Urine

Wash urine stains immediately with warm water.

Sponge with bubble cleaner.

Use warm soap suds and ammonia water.

Sponge with suds, then sponge with ammonia water (1 teaspoonful of ammonia to 5 teaspoonfuls of water).

Sponge with clear water.

Vaseline

Always remove vaseline at once. Boiling water sets the stain. Soak the stain in kerosene or turpentine, then wash it in soap and water.

Vomit

Sponge vomit spots with a soap solution or bubble cleaner.

Water spots

Water spots may come from one of several causes: the sizing in the material has dissolved; a change in texture has resulted from the tightening of the fibers; the luster given fabrics by the final pressing in the finishing process has disappeared.

Often water spots may be removed by letting the spot dry, then rubbing it with the fingernail or the edge of a coin. Rubbing the spot with another section of the material and pressing the whole article under a damp cloth often helps. Spots from dissolved sizing are difficult to remove without laundering.

A new finishing process has been developed for silks which makes them resistant to water spots. In buying material to be made up at home, it is wise to ask for that which is water-spot proof, and in buying ready-made clothing to demand the same kind.

Acetic acid, a clear, colorless liquid with a pungent odor, is sometimes effective in removing water spots due to the loss of luster. Vinegar contains from 4 to 5 per cent of acetic acid, hence to restore luster, place a silk fabric in a solution containing $\frac{1}{2}$ cupful of vinegar to 1 quart of water, letting the material remain there for about ten minutes. Dry the silk without rinsing and press it while damp. If the color of the silk will run with hot water, use cool water.

Wine

Cover wine spots with salt and pour boiling water through the stain from a height, or sponge with a bubble cleaner.

COMPLEX STAINS

Stains made up of two or more staining substances complicate the situation. Each one must be treated as two or three stains. For example, homemade ice cream contains egg, cream, sugar, and fruit juices or coloring matter. The egg and sugar may be removed by cold water, and the cream with a fat-dissolving agent, such as carbon tetrachloride. Any stain remaining should be treated as a fruit stain (page 32).

Gravy contains fat and starch. Remove the fat with a grease-dissolving agent. Then remove the starch by sponging with clear warm water.

REMOVING PRINTING FROM SACKS

The ease with which printing may be removed from sacks depends upon the kind of material used in printing. Paint, dye, and ink are frequently used, and of these printer's ink is the most difficult to remove.

Rinse the sacks first in cold water, then rub any good laundry soap on the printing. Soak the sacks overnight in kerosene, and in the morning wash them in heavy suds. If the printing is not yet gone, boil the sacks in a lye solution made by dissolving 1 teaspoonful of lye in 1 gallon of water and straining the solution. Add the lye solution to plenty of water for boiling. Then rinse the sacks in vinegar water, using 2 tablespoonfuls of vinegar to 1 gallon of water, in order to neutralize the effect of the lye. Rinse the sacks three times in clear water.

The following method will sometimes remove printer's ink. Success depends upon the kind of ink used. Make a solution in the proportion of 2 tablespoonfuls of chloride of lime to 1 quart of hot water. When cool, place the sacks in the bleach with sufficient water to cover them and allow them to remain there for twenty-four hours. Rinse the sacks in vinegar water, then wash them.

If paint has been used in printing, the sacks may be soaked in turpentine and then boiled in heavy suds. Some printing may be removed easily by soaking the sacks in cold water, then boiling them in heavy suds, but the sacks may have to be boiled several times before they are bleached sufficiently for use.

CAUTION

Stain removal should be approached with caution, and unless reliable directions are available and carefully followed, it is best to leave a spot alone, as the result of attempted stain removal may be far more unsightly than the original stain. Often, too, irreparable damage may be done to the fabric or the dye. Stain removal is time-consuming work, and should be approached only in a scientific spirit of utmost patience and willingness to experiment. There is no universal stain remover, for each stain is a special problem requiring special attention and treatment. In this household skill, no piece of equipment is as important as one's own hands, and nothing can replace them. When clothes go to the cleaners, they are carefully inspected and all outstanding spots are carefully removed by hand.

Stain removal
requires patience.

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HELPFUL LEAFLETS AND BOOKS

Many manufacturers and most women's magazines publish leaflets that deal with spot and stain removal. A few leaflets and books are listed.

Leaflets

Spots and stains: How to remove them. By Gertrude L. Smith. 161 Sixth Avenue, New York City.

How to wash and iron. By Gertrude L. Smith. 161 Sixth Avenue, New York City.

Stain removal. 230 Park Avenue, New York City.

Jane Oliver's spot book. Jane Oliver, 22d and 54th Avenue, Chicago, Illinois.

Celanese spotting chart (revised). National Association of Dyers and Cleaners of the United States and Canada, Silver Spring, Maryland.

Removing spots and stains. 57th Street at 8th Avenue, New York City.

Laundry equipment and methods. 57th Street at 8th Avenue, New York City.

Spot removal index. Cooperative Distributors, Inc., 128 East 16th Street, New York City.

Stain removal from fabrics: Home methods. Farmers' Bulletin 1474. United States Department of Agriculture, Washington, D. C.

On the spot. L. C. Chase Co., New York City.

Books

Practical science for the drycleaning industry. By Warren K. Cooley. National Association of Dyers and Cleaners of the United States and Canada, Silver Spring, Maryland.

Housewifery. By Lydia Ray Balderston. J. B. Lippincott Co., Philadelphia, Pennsylvania.

Textiles. By Paul H. Nystrom. D. Appleton and Co., New York City.

Laundering. By Lydia Ray Balderston. J. B. Lippincott Co., Philadelphia, Pennsylvania.

The sewing book. By Blanch E. Hyde. The Century Co., New York City.

Textile fabrics. By Elizabeth Dyer. Houghton Mifflin Co., New York City.

Care of clothing. Woman's Institute, Scranton, Pennsylvania.

Chemistry applied to home and community. Pauline G. Berry. J. B. Lippincott Co., Philadelphia, Pennsylvania.

Chemistry in dry cleaning. National Association of Cleaners and Dyers of the United States and Canada, Silver Spring, Maryland.

WATCHWORDS FOR STAIN REMOVAL

Remove the stain as soon as it appears.

Be willing to put plenty of time on the operation.

Determine the cause of the stain, then work on that information.

Use the simplest reagents first.

Always try the effect of the reagent on an unexposed part of the garment to see what happens.

Use reagents sparingly, keep in mind that many short applications are more effective than one long one.

Rinse the material after each application of a reagent.

Use the method suited to the stain. In general, use the pad method when applying solvents, and the bowl method when applying bleaches.

Work rapidly when using chemicals.

Neutralize an acid after each application of a chemical.

Always work in a good light.

Be patient.

Be persevering.

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